Information and Intelligent Systems:

Advancing Collaborative and Intelligent Systems and their Societal Implications

Program Solicitation
NSF 05-551

National Science Foundation
Directorate for Computer and Information Science and Engineering
Division of Information and Intelligent Systems

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

May 03, 2005

Collaborative Systems, Universal Access

May 05, 2005

Robust Intelligence, Digital Government, Digital Libraries and Archives

Third Tuesday in April

Beginning in 2006 for Collaborative Systems, Universal Access

Third Thursday in April

Beginning in 2006 for Robust Intelligence, Digital Government, Digital Libraries and Archives

REVISIONS AND UPDATES

The following solicitations are replaced by this solicitation:

- Artificial Intelligence & Cognitive Science (NSF 03-600)
- Computer Vision (NSF 03-602)
- Human Language and Communication (NSF 03-613)
- Information and Data Management (NSF 04-500)
- International Digital Libraries Collaborative Research and Applications Testbeds (NSF 02-085)
- Digital Government (NSF 04-521)
- Digital Society and Technologies (NSF 03-611)
- Human-Computer Interaction (NSF 03-610)
- Robotics (NSF 03-601)
- Universal Access (NSF 03-612)

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Information and Intelligent Systems:
Advancing Collaborative and Intelligent Systems and their Societal Implications.

Synopsis of Program:

NSF's Division of Information and Intelligent Systems is seeking proposals that describe ambitious research and/or education projects that will extend the state-of-the-art in:

- **Collaborative Systems:** systems that enable collaboration between a person and either machines or other people in acquiring, representing, organizing, archiving, protecting, accessing and communicating information, and
- **Robust Intelligence:** systems with robust and flexible intelligence, capable of perceiving, reasoning, learning, and interacting with their environment.

Additionally, the Division is seeking research and/or education proposals that use or extend Collaborative Systems and Robust Intelligence theories or methods and apply them in three application areas:

- **Universal Access**: to increase access to information and systems by users, such as the vision-impaired or the elderly, whose needs are often not met in traditional systems.
- **Digital Government**: to improve access to information and services provided by governmental entities; as well as the workings of governments.
- **Digital Libraries and Archives**: to represent, store and access information from curated digital libraries and archives.

Single or multidisciplinary research and/or education projects will be supported that explore innovative ideas, theories and experiments that move beyond incremental advances to enable fundamentally different intelligent or collaborative systems approaches or paradigms. The development of curricular materials that have the potential to greatly improve higher education in Collaborative Systems and Robust Intelligence and their applications will also be supported. Curriculum development projects may be submitted as stand-alone proposals or may be included as part of broader research and education proposals under the categories above.

Cognizant Program Officer(s):

- Lawrence E. Brandt, Program Director, Digital Government, Directorate for Computer & Information Science & Engineering, Division of Information and Intelligent Systems, 1125 S, telephone: (703) 292-8930, fax: (703) 292-9073, email: lbrandt@nsf.gov

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Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.070 --- Computer and Information Science and Engineering

Eligibility Information

- **Organization Limit:** Proposals will only be accepted from 1) US colleges, universities, and organizations of higher education; 2) US independent nonprofit research organizations; and 3) US independent research museums.
- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** In response to this solicitation, an investigator may participate as PI, Co-PI or senior personnel in no more than TWO proposals annually. There is no limit on the number of proposals an organization may submit.

Award Information

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 150 awards, with up to 125 awards averaging $100,000 per year for 3 years; up to 25 awards averaging $250,000 per year for 3 years; and up to 2 awards averaging $500,000 per year for 3 years
- **Anticipated Funding Amount:** $60,000,000 in FY 2006 pending availability of funds ($48,000,000 total for Collaborative Systems and Robust Intelligence awards, and $12,000,000 total for Digital Government, Universal Access and Digital Library and Archives awards.)

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Full Proposal Preparation Instructions:** Standard GPG Guidelines apply.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Not Applicable.

C. Due Dates

- **Full Proposal Deadline Date(s)** (due by 5 p.m. proposer's local time):

  May 03, 2005
  Collaborative Systems, Universal Access
  May 05, 2005
  Robust Intelligence, Digital Government, Digital Libraries and Archives
  Third Tuesday in April
  Beginning in 2006 for Collaborative Systems, Universal Access
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Proposal Review Information

- **Merit Review Criteria:** National Science Board approved criteria apply.

Award Administration Information

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

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I. INTRODUCTION

The Division of Information and Intelligent Systems (IIS) supports research and education projects that (1) increase the capabilities of individuals via interaction with information systems or via machine-mediated interactions with other people, and (2) advance the understanding and development of the foundations of robust intelligent systems. Research activities supported will result in discoveries in the field of Information and Intelligent Systems and the preparation of future generations of IT professionals with expertise in Information and Intelligent Systems. Curriculum development activities funded will result in the development and dissemination of curricular materials that have the potential to greatly improve higher education in Information and Intelligent Systems.

II. PROGRAM DESCRIPTION

Through this solicitation, the Division is seeking ambitious research and/or education proposals focused in two core research areas:

- **Collaborative Systems**: research fundamental to designing, extending, or evaluating the use or consequences of systems that facilitate collaboration between individuals and other people or machines. Collaborative Systems subsume topics from the prior IIS program areas of Digital Society and Technologies, Human Computer Interaction, and Information and Data Management.
- **Robust Intelligence:** research fundamental to the development of computer systems capable of performing intelligent tasks robustly and flexibly. Robust Intelligence subsumes topics from the prior IIS program areas of Artificial Intelligence and Cognitive Science, Computer Vision, Human Language and Communication, and Robotics.

In addition, the Division is also seeking research and/or education proposals that apply fundamental knowledge in Collaborative Systems and Robust Intelligence to one or more of the following three application areas:

- **Digital Government (DG):** research outcomes will improve access to: information and services provided by government; and, the workings of government. Research challenges are most often effectively addressed through interactions between the computing research community, the social, political, and behavioral science research

community, and government agencies.

- **Digital Libraries and Archives (DLA)**: research outcomes will lead to advances in both technical and policy issues concerned with the design and use of curated digital libraries and archives.
- **Universal Access (UA):** research will lead to advances in computer systems technology so that all people can interact effectively with and leverage the full power of computing.

All proposals focused on making contributions in Universal Access, Digital Government or Digital Libraries and Archives application areas must indicate which of the two core research areas they are using or extending theories or methods from - Collaborative Systems and/or Robust Intelligence.

For proposals submitted in response to this solicitation, all research activities proposed must promise impact beyond the scientific community in which the work is normally published. Revolutionary research approaches that extend beyond existing paradigms, and integrative research that spans multiple existing fields, are strongly encouraged. Research activities should focus on advancing the state of the art in the development of Collaborative and/or Intelligent systems and their applications, and may include novel modeling and integration approaches and evaluation methodologies. Because research in Collaborative Systems and Robust Intelligence is often interdisciplinary in nature, proposals that bring together collaborators and new ideas from related disciplines are encouraged. Proposals may involve teams of investigators as needed to fulfill project objectives.

Research is encouraged that promotes development of modular, sharable, extensible code, tools, data resources, knowledge representation schemes and repositories, annotation formats, and evaluation methods and metrics. Proposals should request support for necessary items including equipment and other infrastructure to carry out the proposed activities.

Proposals that include curriculum development activities may be submitted to either of the two core research areas and/or to the three application areas. When a proposed project focuses ONLY on curriculum development, the proposal title must begin with “Curriculum Development:”. All curriculum development activities proposed must include strong justification of the need for the new materials and must include plans for disseminating them to the community and for evaluating their effectiveness.

A more complete description of the Division’s interests in the two core research areas and three application areas is provided below:

Collaborative Systems research will develop principles for designing, optimizing and updating information flow to most effectively support problem solving and use of information technology in highly distributed and rapidly changing environments in the support of long-term goals of individuals and/or organizations. Problems addressed by the Collaborative Systems area include storing, accessing and organizing, interpreting, protecting, summarizing, managing and using vast and growing quantities of IT-based data, information and knowledge that may be uncertain and incomplete. The Collaborative Systems of the future will be knowledge-intensive, dynamic and capable of supporting individuals, teams, enterprises and societies in a variety of tasks including, for example, electronic publishing, e-commerce, business, entertainment, government, health care, open source software development, national security or disaster management. Collaborative Systems of the future will provide seamless access to a variety of information in different environments spanning high-performance grids to wireless mobile personal information appliances, so that people and machines can effectively exchange information needed for collaborative problem solving.

Research in collaborative systems involves analysis of the problems addressed by collaborations, the context in which the problems arise and information technology is deployed, the development of new theories and approaches to solving problems, the interaction between users and machines, and IT-mediated collaboration among people to solve problems. Collaborative Systems research will develop principles for designing, optimizing and updating information flow to most effectively support problem solving and use of information technology in highly distributed and rapidly changing environments in the support of long-term goals of individuals and/or organizations.

Collaborative Systems topics include, but are not limited to:

- Data, text, speech, and multimedia storage, organization retrieval, and mining. Extraction of structured information from unstructured sources. Information discovery, fusion, summarization, and visualization.
- Algorithms for personalizing, organizing, navigating, searching, interpreting, and presenting information of different types, using various modalities.
- Designing, managing, and governing information infrastructures.
- Knowledge environments for science and engineering.
- Physical and cognitive interaction between a person and a robotics system and robots to project and extend human capabilities into unknown and hazardous environments.
- Policy and technical issues, including security and privacy issues, that relate to sharing information across boundaries.
- Innovation and learning in distributed systems.
- Multimedia and multi-modal interfaces in which combinations of speech, text, graphics, gesture, movement, touch,

sound, etc. are used by people and machines to communicate with one another.
- Intelligent interfaces and user modeling. Information visualization. Adaptation of content to accommodate different display capabilities, modalities, bandwidth and latency.
- Information privacy research that explores policies and technologies that permit collaboration across organization boundaries, and the ability to draw conclusions from data while still maintaining the privacy of individuals, including definitions of privacy other than confidentiality-security, for example conceiving of privacy as the reciprocal of intimacy in online contexts.
- Problem solving in distributed environments, ranging across Internet-based information systems, grids, sensor-based information networks, and mobile and wearable information appliances.
- Models for effective mediated human-human interactions under a variety of constraints, (e.g., video conferences, collaboration across high and low bandwidth networks, etc.).

Robust Intelligence involves the theory, design, and implementation of general, integrated, intelligent perception and reasoning capabilities that are not constrained to address only a single problem in isolation or in one particular context. Systems exhibiting Robust Intelligence will be able to respond intelligently in novel situations, and to gaps, conflicts, and ambiguities in their knowledge and capabilities. Inspired by the flexibility and generality of intelligence in people and animals, Robust Intelligent systems will be able to autonomously assess their environment, construct plans to achieve general goals, learn transferable lessons from their experiences, and communicate their knowledge, conclusions and reasoning to others.

Robust Intelligence is resourceful, innovative and flexible in reasoning and in representing knowledge and experiences. Systems exhibiting Robust Intelligence are capable of harnessing past experiences to solve new problems and to meet new expectations. They are able to use a variety of reasoning approaches, such as analogical, statistical and logical inference, to deal with open-ended and changing concepts and environments and to integrate possibly heterogeneous knowledge and reasoning methodologies in complementary and supplementary ways. They are able to learn new representations. Not only are they able to improve things they are currently tasked with, but they are also, and perhaps even more importantly, able to anticipate and propose new ones. They are able to reason, act, and learn about their tasks, users, environments, and themselves so that they can evolve and grow in capability and robustness.

While not every project funded will develop complete integrated solutions, projects that focus on advancing a single aspect of intelligence (e.g., representation, learning, reasoning, perception, understanding, communication) must lead towards the more general goal of Robust Intelligence.

Robust Intelligence topics include, but are not limited to:

- Integrated or hybrid architectures that integrate learning, memory and problem solving or combine deductive, probabilistic, analogical, symbolic or sub-symbolic reasoning.
- Emergence of complex intelligence from simple components including multi-agent systems and cooperation among multiple robots.
- Computational models of human cognition, perception, and communication for commonsense or specialized domains such as medicine or mathematics, or for specialized tasks such as spatial cognition or decision-making.
- Knowledge representation for common sense or scientific domains, including distributed representation of knowledge (e.g., semantic web).
- Robotics for unstructured environments with novel approaches to sensing, perception, and actuation, including autonomous manipulation.
- Scene understanding and the recognition, classification, and identification of objects, people, events, and activities from 2D and 3D images or video.
- Models of image formation and of the statistics of natural images.
- Understanding text, speech, and other communicative forms, as well as their underlying meaning, intent, and realization, including semantic interpretation, cognitively and neuro-linguistically informed approaches.
- Generating text, speech or multi-modal communication to convey meaning and intent.

Digital Government research involves inquiry at the intersections of computing research, social, political, and behavioral science research, and the problems and missions of government agencies. Digital Government projects proposed must clearly draw upon research in Collaborative Systems (e.g., information organization and sociotechnical analysis of problems) or Robust Intelligence (e.g., semantic web). As appropriate, proposed projects will demonstrate a strong academic/ government partnership in their design and execution.

Two classes of proposals are sought in the Digital Government area:

- Partnerships of computer science researchers and government agencies with the goal of building advanced technology that addresses challenges at the participating agencies.
- Social, political, and behavioral research on the effect of IT on forms, processes, impact and outcomes within government, both from the standpoint of government agencies and from the standpoint of the public. Relevant topics include, but are not limited to: government organizational forms, learning, and adaptation; new forms of government-government and government-citizen interactions; and digital democracy.

Proposals containing well-integrated elements of both classes are particularly welcome. Proposals must address the unique role that IT plays in government.

Digital Government research topics include the special issues that arise in government contexts, including: providing citizens with access to the enormous breadth, complexity and scale of information and services while maintaining citizens trust ensuring integrity of systems and information and respecting privacy. Similarly, citizens have expectations that government decision-making is participatory and transparent and is based on societal mores as expressed in law, regulation and administrative procedures.

Digital Libraries and Archives research involves the investigation of both technical and policy issues concerned with the construction and use of large digital libraries and archives. Digital Library and Archive projects must draw upon research in Collaborative Systems (e.g., information retrieval or human-computer interaction) or Robust Intelligence (e.g., computer vision).

Digital Libraries and Archives topics include, but are not limited to:

- Deriving improved means for representing, indexing, and accessing digital content, particularly non-text content such as 2-D or 3-D images, audio, video, and relational structures such as graphs, molecules, etc. This representation often includes extracting features from multi-media content or extraction of structured information.
- Understanding the needs of the users of digital libraries and archives, the tasks that they perform, and how a digital library or archive may use information about the user's goals to tailor the presentation of information to the user.
- Locating digital content in large, distributed knowledge environments, searching across specialized corpora, and combining results sets from searches.
- Conducting research on providing contextual information on digital content that allows machine-understandable translation and semantic manipulation, including translation between formats, standards and formalisms.

Research providing a better understanding of policy issues in digital libraries and archives will also accelerate the deployment of digital resources. Projects exploring alternatives or leading to consensus on important policy issues such as economic and organizational models for collecting, curating, storing, and preserving digital content are encouraged.

Universal Access (UA) involves research in computer science that advances computer systems technology so that all people can interact effectively with and leverage the full power of computing. Universal Access projects must draw upon research in Collaborative Systems (e.g., human-computer interaction) or Robust Intelligence (e.g., language or image processing).

UA research outcomes will empower people with disabilities, young children, seniors, and members of other traditionally under-represented groups to participate fully in the new information society. UA research topics derive from all aspects of human-computer interaction and include, but are not limited to:

- Development of new models, architectures, and programming languages that emphasize interface speed and usability by all.
- Definition of semantic structures for multimedia information to support cross-modal I/O.
- Development of specific solutions to address the special needs of particular communities.
- Experimental studies to evaluate the success of attempts to provide access in all its varied forms.

III. ELIGIBILITY INFORMATION

Organization Limit: Proposals will only be accepted from 1) US colleges, universities and organizations of higher education; 2) US independent nonprofit research organizations; and 3) US independent research museums.

Limit on the Number of Proposals: In response to this solicitation, an investigator may participate as PI, Co-PI or senior personnel in no more than TWO proposals annually. There is no limit on the number of proposals an organization may submit.

IV. AWARD INFORMATION

NSF expects to make the following type of award(s): Standard or Continuing Grant . The estimated number of awards is approximately 150, with up to 125 awards averaging $100,000 per year for 3 years; up to 25 awards averaging $250,000 per year for 3 years; and up to 2 awards averaging $500,000 per year for 3 years. It is anticipated that approximately $60,000,000 will be available for new awards ($48,000,000 total for Collaborative Systems and Robust Intelligence awards, and $12,000,000 total for Digital Government, Universal Access and Digital Libraries and Archives awards).

Estimated funds available, number of awards and average award size/duration are subject to the availability of funds.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Instructions:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Website at: http://www.nsf.gov/cgi-bin/getpub?gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

Proposers are reminded to identify the program announcement/solicitation number (05-551) in the program announcement/ solicitation block on the NSF *Cover Sheet For Proposal to the National Science Foundation*. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing:

Cost sharing is not required in proposals submitted under this Program Solicitation.

C. Due Dates

Proposals must be submitted by the following date(s):

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

May 03, 2005
Collaborative Systems, Universal Access

May 05, 2005
Robust Intelligence, Digital Government, Digital Libraries and Archives

Third Tuesday in April
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D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: https://www.fastlane.nsf.gov/a1/newstan.htm. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: http://www.fastlane.nsf.gov

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 (NSB 97-72). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued Important Notice 127, Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the Grant Proposal Guide Chapter III.A for further information). The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which he/she is qualified to make judgments.

What is the intellectual merit of the proposed activity?
How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?
How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

NSF staff will give careful consideration to the following in making funding decisions:

Integration of Research and Education
One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities
Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented

minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Ad Hoc and/or panel review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

NSF is striving to be able to tell proposers whether their proposals have been declined or recommended for funding within six months. The time interval begins on the closing date of an announcement/solicitation, or the date of proposal receipt, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1); * or Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/cgi-bin/getpub?gpm. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Website at http://www.gpo.gov.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project reporting system, available through FastLane, for preparation and submission of annual and final project reports. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding this program should be made to:

- Lawrence E. Brandt, Program Director, Digital Government, Directorate for Computer & Information Science & Engineering, Division of Information and Intelligent Systems, 1125 S, telephone: (703) 292-8930, fax: (703) 292-9073, email: lbrandt@nsf.gov
- Ephraim P. Glinert, Program Director, Universal Access and Collaborative Systems, Directorate for Computer & Information Science & Engineering, Division of Information and Intelligent Systems, 1125 S, telephone: (703) 292-8930, fax: (703) 292-9073, email: eglinert@nsf.gov
- Stephen M. Griffin, Program Director, Digital Libraries and Archives, Directorate for Computer & Information Science & Engineering, Division of Information and Intelligent Systems, 1125 S, telephone: (703) 292-8930, fax: (703) 292-9073, email: sgriffin@nsf.gov
- Mary P. Harper, Program Director, Collaborative Systems, Directorate for Computer & Information Science & Engineering, Division of Information and Intelligent Systems, 1125 S, telephone: (703) 292-8930, fax: (703) 292-9073, email: mharper@nsf.gov
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For administrative process questions related to the solicitation please contact:

- Lisa R. Wilson, Integrative Activities Specialist, Directorate for Computer & Information Science & Engineering, Division Information & Intelligent Systems, 1125 S, telephone: (703) 292-8463, fax: (703) 292-9073, email: lwilson@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Helpdesk, telephone: 800-673-6188, email: fastlane@nsf.gov

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at http://www.nsf.gov/cgi-bin/getpub?gp. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF E-Bulletin, which is updated daily on the NSF Website at http://www.nsf.gov/home/ebulletin, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's Custom News Service (http://www.nsf.gov/home/cns/start.htm) to be notified of new funding opportunities that become available.

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The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Division of Administrative Services, National Science Foundation, Arlington, VA 22230.

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